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SOME NEW GASTROPODS OF THE FAMILY CLAUSILIIDAE FROM THE PHILIPPINE ISLANDS AND SIAM

By F. E. Loosjes

While studying the Clausiliidae (Gastropoda, Pulmonata) of southeastern Asia, I have had the opportunity of revising the species of this area present in the United States National Museum, through the kindness of Dr. H. A. Rehder. Among these shells I found three forms thus far unknown to science: two from Calayán Island, one of the northern islands of the Philippines belonging to the Babuyanes group, about 75 km. north of Luzón and 300 km. south of Formosa; and one from northern Siam. Descriptions of these three new forms, two species and a subspecies, are given below.

Genus ZAPTYX Pilsbry

ZAPTYX (ZAPTYX) ANNAE, new species

Figure 51

Shell small, sinistral, club-shaped, the spire broad, the lateral outlines becoming somewhat concave toward the proportionally wide, obtuse apex; thin, semitransparent, brown, nearly dull, in a series of specimens in various shades merging into yellowish gray.[1] Whorls 7 to 8½, slightly convex, sculptured with fine, rather straight, parallel ribs, irregularly distributed, sometimes ending on the middle of the whorl (36 to 107 ribs on the penultimate whorl); protoconch consist-

[1] One gets the impression that there are a number of brown-colored specimens, a number of yellowish gray-colored "albinotic" specimens, and some specimens of intermediate color, but it is not easy to ascertain the limits of each group; there are individuals that may be placed as well in the one group as in the other.

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ing of two smooth, glossy whorls. The striation is not perceptibly coarser on the last whorl. Aperture wide, nearly quadrangular; sinulus scarcely perceptible, separated only by the superior lamella. The peristome is continuous whitish, narrowly reflexed, hardly thickened, the upper margin adnate or barely free from the preceding whorl.

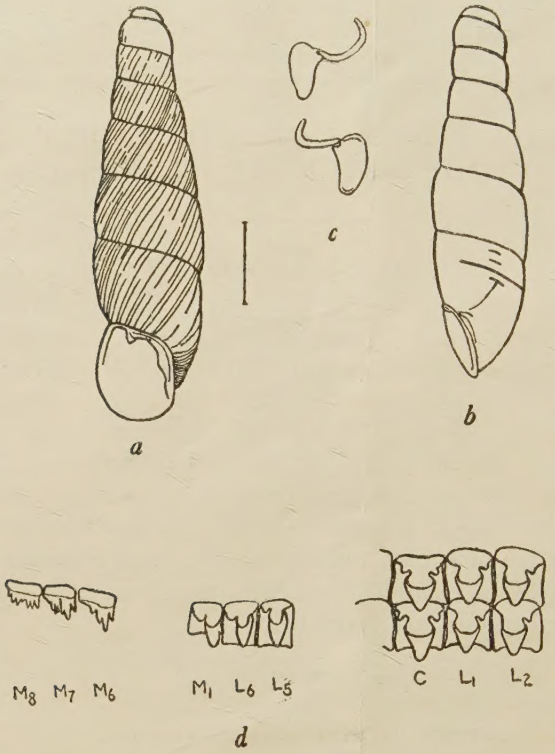

FIGURE 51.—*Zaptyx* (*Zaptyx*) *annae*, new species: *a*, Ventral side of holotype (the vertical line seen here and in the following figures represents the actual size of the holotype); *b*, right side of a paratype (the ribs are omitted); *c*, clausilium (× 5); *d*, radula (× 390).

Superior lamella short, compressed, vertical, just reaching the margin, generally (83 out of 96 specimens) distant from the low spiral lamella, which extends inward nearly to the middle of the ventral side.

Inferior lamella visible in a frontal view as a low fold on the columella, reaching the margin in the right corner. It ascends vertically inward halfway on the visible part of the columella, at the same time increasing in height; abruptly becoming low again at a lateral position just before leaving the columella and continuing on the parietal wall, then extending inward nearly as far as the spiral lamella.

Subcolumellar lamella deeply immersed, its lower end not visible within the aperture.

The closing apparatus lies laterally. Principal plica less than a half-whorl long. Lunella oblique, above contiguous to a short upper palatal plica, below slightly curved inward.

Sutural plicae, fulcrum, and parallel lamella are developed as is characterized in *Zaptyx* s. s.

The clausilium (fig. 51, *c*) as usual in *Zaptyx*, with the curvature chiefly near the filament; the distal end is rounded and the clausilium is deeply excised on the columellar side at the filament.

The radula (fig. 51, *d*) has the dental formula $\frac{1}{3}+\frac{6}{2}+\frac{10}{3-\infty}\times$ca. 80; basal plates of rhachidian teeth and laterals broad, nearly quadrangular.

Measurements: Length, 8.6 to 11.7 mm. (average, 9.7 mm.); diameter, 2.2 to 2.8 mm. (average, 2.5 mm.); aperture: height, 1.9 to 2.6 mm. (average, 2.2 mm.); width, 1.4 to 1.9 mm. (average, 1.7 mm.). The averages are taken from 106 specimens. The type measures: Length, 10.8 mm.; diameter, 2.8 mm.; aperture: height, 2.6 mm.; width, 1.9 mm.

The type (U.S.N.M. No. 488973) and two lots of paratypes (U.S.N.M. Nos. 256581 and 485571) were collected on Calayán Island, Babuyanes group, Luzón, Philippines. All were received from the Philippine Bureau of Science.

This species is the first zaptychoid form recorded from a locality south of Formosa. There is no doubt that it must be placed in Pilsbry's section *Zaptyx* s. s. (distributed throughout the Ryukyu Chain, Bonin Islands, and Formosa), near species like *sarissa* Pilsbry and *nakanoshimana* Pilsbry. It differs from these by its club-shaped appearance, by its larger diameter, by the striation being not only behind the lip on the last whorl but extending to the whole shell, excluding only the embryonic whorls, by the rather thin peristome, the inferior lamella continued on the parietal wall, etc.

It is named in honor of my wife, who is much interested in my study and who is contributing to it by furnishing as complete a survey as is possible of the literature on the Clausiliidae.

ZAPTYX (ZAPTYX) REHDERI, new species

FIGURE 52

Shell of medium size, sinistral, club-shaped, the spire thick with nearly straight lateral outlines, slowly and regularly tapering into the broad obtuse apex. Sometimes the early whorls may be somewhat in the shape of a staircase; thin, not transparent, grayish white, rather dull.

Whorls 8½ to 10, the first 5 rather convex, the lower ones nearly flat; faintly but densely striatulate, nearly 200 riblets on the penultimate whorl, nearly smooth to the naked eye, sculpture slightly coarser on the last whorl; protoconch consisting of nearly 2½ smooth whorls.

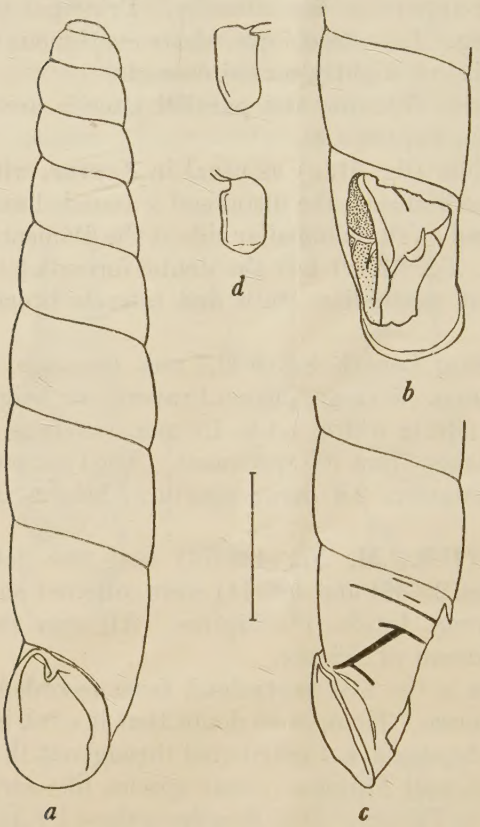

FIGURE 52.—*Zaptyx* (*Zaptyx*) *rehderi*, new species: *a*, Ventral side of holotype; *b*, dorsal side of a paratype, opened to show the inner structure; *c*, right side of a paratype; *d*, clausilium (× 5).

Aperture including the sinulus broadly ovate. Sinulus not high, separated by the superior lamella only. Peristome continuous, whitish, thin, narrowly reflexed, the upper part free from the preceding whorl.

Superior lamella short, compressed, vertical, reaching the margin, separated widely from the spiral lamella, which is scarcely visible in the aperture because it reaches from the ventral to the dorsal side.

Inferior lamella visible in a frontal view as a low fold only in the lower half of the aperture, where it reaches the margin in the right corner. In an oblique view it is visible, increasing in height as it ascends vertically inward, the edge considerably thickened. In a lateral position, where it leaves the columella and runs along the parietal wall, the inferior lamella is abruptly lower, and at last ends as the spiral lamella in the middle of the ventral side.

Subcolumellar lamella deeply immersed, not visible in the aperture. The closing apparatus lies lateroventrally. Principal plica less than

a half-whorl long. Lunella oblique, slightly curved, above in connection with the middle of a short, but distinct upper palatal plica, below touching a faint lower palatal plica that extends mainly outward. Below the ventral inward-curved horn of the lunella lies the end of the subcolumellar lamella.

Between the principal plica and the suture there are two faint sutural plicae, and between the *lamella spiralis* and suture we find the fulcrum and parallel lamella as usual in *Zaptyx* s. s.

Clausilium (fig. 52, *d*) with the curvature chiefly near the filament and deeply excised there on the columellar side. Like the preceding species the sides of the plate are nearly parallel.

The type has 10 whorls and measures: Length, 19.5 mm.; diameter, 3.8 mm.; aperture: height, 3.6 mm.; width, 2.4 mm. One other paratype (U.S.N.M. No. 485510) from the same lot has 8½ whorls and measures: Length, 16.7 mm.; diameter 3.9 mm.; aperture: height, 3.7 mm.; width, 2.6 mm.

The type (U.S.N.M. No. 488974) and paratype (U.S.N.M. No. 485510) were collected on Calayán Island, Babuyanes group, Luzón, by R. C. McGregor.

There is no doubt that this species is closely allied to the preceding one. It too belongs in the subgenus *Zaptyx* and is most closely related to the section of that name. Some characters, however, make it difficult to place it in that section; they are: its length (more than 14 mm. long), the number of whorls (8½ to 10), the ventrolateral position of the closing apparatus, and the presence of a *plica palatalis inferior*. Including the lack of ribs on the whorls, these characteristics are the principal differences from *annae* too.

I propose for this new section, of which *rehderi* is the type and only representative at the moment, the name **Prozaptyx.** It is characterized by the above-mentioned differences from the section *Zaptyx* s. s.

I dedicate this new species to Dr. H. A. Rehder, of the United States National Museum, who introduced this species, among others, to me, and who has always been ready to help my studies.

When Pilsbry constructed his "Zaptychoid phylum" he gathered the forms out of *Hemiphaedusa* to which they belonged at that time. Ehrmann's theory (1927), that the members of the genus *Zaptyx* Pilsbry might be descendants of a now extinct hemiphaedusoid group that might have lived in the southern part of Hondo, was modified in several aspects by Käufel (1930), one point being that the highly specialized zaptychoid Phaedusinae, distributed over the very discontinuous area of islands, south of the Japanese main island, had originated not once but many times from hemiphaedusoid ancestors. Käufel points out that specialization on the main island (*Zaptychopsis* Ehrmann) from its very nature could not have proceeded as far as on the smaller islands. Neither, of course, has the development on

the smaller islands always been going on at the same rate. Seen in that light *rehderi* and *annae* might be links in such a course of development in which *annae* would represent the more specialized phase.

Genus PHAEDUSA Adams

PHAEDUSA (EUPHAEDUSA) ACULUS ANGKANENSIS, new subspecies

FIGURE 53

Shell small and less slender than is usually the case in *aculus*, the lateral outlines being rather straight or slightly convex; thin, semitransparent, greenish or yellowish, glossy. Whorls fewer than usual, 8½ to 9, very weakly striated, nearly smooth, even on the back of the last whorl.

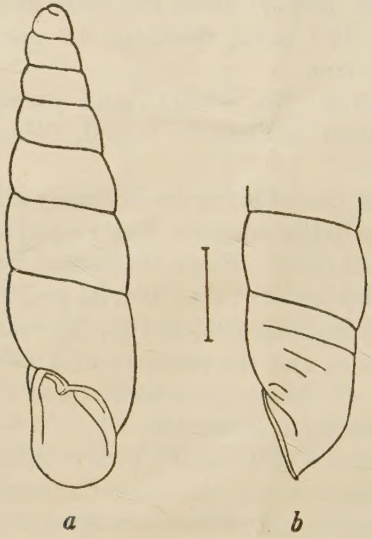

FIGURE 53.—*Phaedusa* (*Euphaedusa*) *aculus angkanensis*, new subspecies: *a*, Ventral side of holotype; *b*, right side of holotype.

Aperture wide, nearly quadrangular with rounded angles. Peristome whitish, thin, scarcely reflexed.

Superior lamella widely separated from the spiral lamella, which extends inward to the middle of the ventral side, not so far as the inferior lamella and the subcolumellar lamella.

Inferior lamella curving spirally inward; the outer margin nearly horizontal, forming with the columella, which is well visible in an oblique view, a forklike structure such as is found in several varieties of *aculus*, for instance, in *insularis* Heude.

Principal plica from ventrolateral right to dorsal. Below it, laterally, there are 3 to 6 nearly parallel palatal plicae, as in other multiplicated forms of *aculus*.

The clausilium shows no particular characteristics.

Measurements: Length, 12.3 to 13.6 mm.; diameter, 2.9 to 3.3 mm.; aperture: height, 2.9 to 3.4 mm.; width, 2.0 to 2.2 mm. The type measures: Length, 12.3 mm.; diameter, 3.1 mm.; aperture: height, 2.9 mm.; width, 2.0 mm.

The color of the type is more corneous yellowish than that of the other specimens; it is, however, the only full-grown and undamaged shell of the set.

The type (U. S. N. M. No. 488975) and the paratypes (U. S. N. M. No. 419857) were collected at Doi Ang Ka, west of Chiang Mai and Lampung, between the Mekong and Salwin Rivers, Siam, by Dr. Hugh M. Smith at 2,520 meters (8,400 feet), from a decaying log.

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[2] Only the most important literature is listed.

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